VINAY TECH

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SQL Server Training

Objectives: • Real-Time Working • Interview Suitable • 70% Exam Coverage

Trainer: Mr. Sreedhar [8+ years of IT Exp, 5+ in SQL]

Duration: 35-40 hours, Daily 1 hour

Modes: Normal / Fast Track / One on One

Fee: (Normal track) 5000/-

Available Batches: 8 AM, 9 AM, 10 AM, 11 AM, 5 PM, 6PM

Institute Provides

- In-Depth **Theory & practical** Material
- Complete **Practical Oriented** Training
- **Mock Interviews**
- Daily **Live Class Videos** Shared
- Good Interaction with the Trainers
- **Resume Preparation** Sessions

Component	Duration
SQL Databases [Cloud & On-premises]	1 Hr
SQL Server Introduction	2 Hrs
SQL & T-SQL elements	2 Hrs
DDL, DML, DCL, TCL, DRL	8 Hrs
Joins, Sub Queries & Set	5 Hrs
Views, Procedures, & Fun	4 Hrs
Cursors & Triggers	3 Hrs
Temporary Tables	2 Hrs
Temporary Variables	2 Hrs
Dynamic SQL & Exceptions	2 Hrs
Miscellaneous	2 Hrs
RESUME PREP & FAQS	2 Hrs

SQL SERVER SCENARIOS

Case Study 1:
Sub Queries, Set Theory, & Joins based

Case Study 2:
Views, Procedures, & Functions based

Case Study 3:
CTE, Temporary Tables, &Variables based

SQL SERVER PROJECTS

A) BANKING PROJECT
with different tables, views, procedure, functions, and queries

Real-time and Real-world examples tailored for better learning

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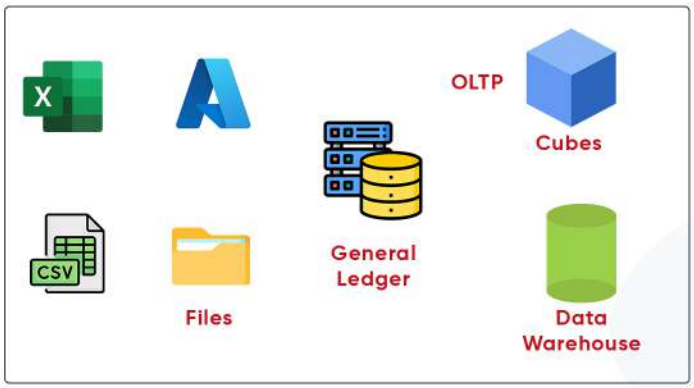
MANDATORY Topic 1: DATA, DATABASE AND DATAWAREHOUSE FUNDAMENTALS

Data and Database Fundamentals

- Data and Data Availability in IT
- Database, Data Warehouse, and RDBMS
- Data storage areas [structured, semi and unstructured
- RDBMS real-time projects and areas
- Components of RDBMS
- Normalized and de-normalized databases

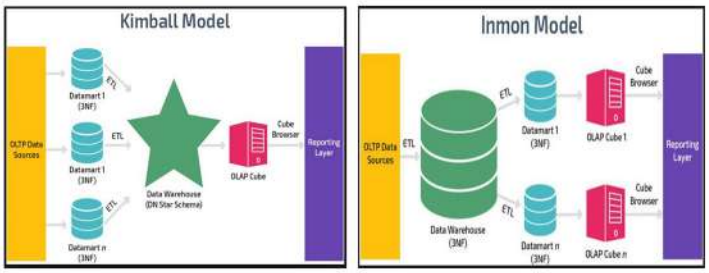
[BI and non-BI]

- SQL Versus T-SQL [MS SQL]
- Other popular database in IT [ORACLE and TERADATA] and differences
- SQL Server Job Market and Opportunities



Data warehouse Fundamentals

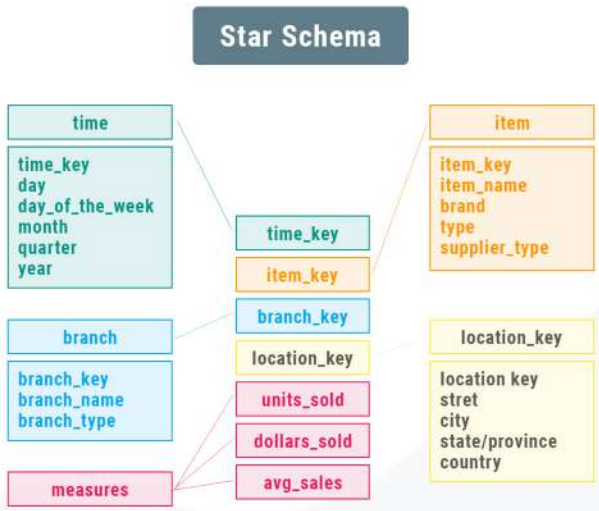
- Data warehouse, Data Mart & differences
- Types of data marts & real-time usage
- ODS, Stage, EDW, and DW definitions
- Data Lake and Blob Storages
- DWH Life Cycles
- DWH Approaches (INMON and KIMBALL)
- Data Granularity, Data movement stages



MANDATORY Topic 2: DATA MODEL FUNDAMENTALS [E-R MODEL AND DIMENSIONAL MODEL]

[Theory and Complete Practical]

- Dimension, Dimension Table & types
- Fact, Fact Table & measures types
- Fact less fact table
- Schemas (Star, Snow Flake, Galaxy & Hybrid)
- Surrogate key and usages in real time
- Business, Conceptual, Logical, Physical Data Models
- 1:1, 1: Many, Many: Many relationships
- Active, Inactive relationships
- Single and Bidirectional relationships
- Cross filtering relationship
- Role Playing real-time usage
- Surrogate key live usages with practical



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TOPIC 1: INSTALLATION [SQL Server Instance]

- Installing SQL Server Instance and multiple Instances
- Installing SQL Server usage client components
- SSMS Installation
- Azure Data Studio understanding
- SQL Developer and Operations Studio
- SQL Server Service Starting

TOPIC 2: SQL Language understanding

- What is SQL?
- How many areas we can use SQL to communicate with Databases?
- SQL usage in OLTP, ETL, Reporting & Analysis Process
- Azure Data Studio understanding
- SQL Versus T-SQL
- Various Tools and Utilities to write SQL

TOPIC 3: SQL Server Editions, Databases, and Tables

- Server name or Instance name & authentication
- Versions and Editions in SQL Server
- Connections [Local and Remote]
- Editions of SQL Server
  - Enterprise Edition
  - Standard Edition
  - Developer Edition
  - Work Group Edition
  - Express Edition
- SQL Server and SSMS Installation
- SQL Server Management Studio
  - Object Explorer
  - Query Editor
- System Databases and User Databases
- System tables and User tables

TOPIC 4: DATABASES AND TABLES

- System Defined Databases and usages
- User defined databases and usages
- Master, MSDB, TEMPDB and others real-time usage
- Database creation GUI and Code [MDF & LDF files]
- SQL Server Agent usage
- Windows Vs. SQL Server Authentication
- System tables and User tables

TOPIC 5: COMMAND, QUERY, AND SQL SERVER ARCHITECTURE

- Differences between command and query
- Query and command execution in SQL Server
- Parser, Compiler, Syntaxer, Optimizer, and CLR
- Storage Engine [SQL Engine]
- Lock, File, Transaction Manager, and Buffer Manager
- Buffers and Threads
- Buffers and Threads

TOPIC 6: SQL SUB LANGUAGES

- SQL Server Data Definition Language [DDL]
- SQL Server Data Manipulation Language [DML]
- SQL Server Data Control Language [DCL]
- SQL Server Transaction Dictionary Language [TCL]
- SQL Server Data Retrieval Language [DRL]

TOPIC 7: DDL [DATA DEFINITION LANGUAGE]

- Creating Table Definitions [CREATE]
- Modifying Table Definitions [ALTER]
- Removing Table Definitions [DROP AND TRUNCATE]
- TRUNACTE and DROP performance differences
- SQL Server Data Types
- Create table from another table

TOPIC 8: DML [DATA MANIPULATION LANGUAGE]

- Inserting data into table [SELECT, INSERT and SELECT]
- Single Insert and Multiple Inserts
- Modifying table data [UPDATE]
- Removing table data [DELETE]
- BULK INSERT and BCP [Bulk Copy Program]
- MERGE command operation and Incremental Load [SCD and CDC]
- SQL Server Data Types
- Insert table from another table

TOPIC 9: DCL [DATA CONTROL LANGUAGE]

- Providing privileges [GRANT]
- Removing privileges [REVOKE AND DENY

TOPIC 10: TCL [TRANSACTION CONTROL LANGUAGE]

- Saving work [COMMIT]
- Restore work [ROLLBACK]
- Saving period of work [SAVEPOINT]

TOPIC 11: DRL [DATA RETRIEVAL LANGUAGE]

- Working on SELECT statement
- Working on WHERE, GROUP BY, HAVING, and ORDER BY
- Column and Table Aliases usage

TOPIC 12: DATA FILTERING CLAUSES

- =, !=, <>, >, <, <=, =< etc... comparison Operators
- AND, OR, NOT Logical operators
- +, -, *, / , Mod, Exp etc...Mathematical Operators
- Order By, Top, Where, From and Like
- Group by and Having
- IN, NOT IN, BETWEEN and NOT BETWEEN
- ISNULL and NOT ISNULL

TOPIC 13: MULTI TABLE OPERATIONS [COLUMN-WISE]

- Simple Sub Query
- Correlated Sub Query
- Differences between simple and correlated
- Nested Sub Query
- Working on TOP, MAX, and MIN real time queries

TOPIC 14: MULTI TABLE OPERATIONS [ROW-WISE SET THEORY]

- Set theory generic protocols
- INTERSECT
- UNION
- UNION ALL
- EXCEPT
- Working on incremental loading

TOPIC 15: MULTI TABLE OPERATIONS [COLUMN WISE-JOINS]

- JOINS real time usage
- CROSS JOIN and CROSS APPLY
- INNER JOIN [EQUI, NON EQUI]
- NATURAL JOIN
- SELF JOIN
- INNER Vs. OUTER JOIN
- LEFT OUTER JOIN
- RIGHT OUTER JOIN
- FULL OUTER JOIN
- Working on ON and WHERE clauses
- MERGE JOIN
- LOOP JOIN
- HASH JOIN
- Unmatched data retrieval
- Incremental load in real time using Joins

TOPIC 16: BUSINESS DATA CONSTRAINTS AND DATA RULES

- CHECK, NOT NULL, AND DEFAULT – Domain Integrity
- Primary Key usage and limitations
- Unique Key usage and limitations
- Referential Integrity and FORGINE KEY
- Candidate key and Alternate key
- Normal column and Identity column
- Surrogate key and Identity column usage
- CASCADING OPTIONS
  ON DELETE CASCADE, ON UPDATE CASCADE, ON DELETE SET NULL,
  ON UPDATE SET NULL, ON UPDATE SET NO ACTION(Default)

TOPIC 17: INDEXS [BASICS-ADVANCED]

- Clustered Index Design and Structures
- Nonclustered Index Design and Structures
- Unique Index Design
- Index with Included Columns
- Column storage index
- Full-Text Index population
- Filtered Index Design
- Covering Index Design
- B-Tree and Online Indexes
- Indexed views Vs. Materialized views
- Fill Factor, TEMPDB, Pat_Index

TOPIC 18: SCHEMAS, SYNONYMS, SYSTEM DEFINED VIEWS AND PROCEDURES

- What is Schema? and real time advantages with practical.
- What is Synonym? and real time advantages with practica
- System Defined Procedures usage with examples
  sp_help, sp_helpdb, sp_helptext, sp_rename, sp_recompile, sp_tables
- System Defined Views usage with examples
  sys.tables sysjobactivity, sysssislog

TOPIC 19: DISTINCT, GROUP BY, ROLLUP, AND CUBE

- Differences between GROUP BY and DISTINCT and performance impact
- GROUP BY and HAVING usages to identify and eliminate duplicates
- ROLLUP and CUBE usages
- Generating FULL TOTALS and SUB TOTALS
- Comparing ROLLUP, CUBE and GROUP functions

TOPIC 20: VIEWS [USER DEFINED]

- Advantages of Views in SQL
- Tables Vs. Views
- Simple View (Updatable View)
- Complex View (Non-Updatable View)
- Materialized View and real time usage
- Encrypted views Vs. Cascading views
- Limitations of Views

TOPIC 21: FUNCTIONS [SYSTEM, USER DEFINED, AND ANALYTICAL]

- Date and Time Formats and Functions
- Scalar - Valued Functions
- Table - Valued Functions
- String Functions
  SUBSTRING, REPLICATE, REPLACE
  REVERSE, CHARINDEX
  LEFT, RIGHT, LEN
  DFFERENCE, SOUNDEX
  STRING_SPLIT
- Mathematical Functions
  ABS, ROUND, LOG
  FLOOR, CEILING
  SUM, AVG, MAX, MIN, COUNT
  SQUARE ROOT, SQUARE
  SIN, TAN, COS

- Date Functions
  - DATEADD, DATE DIFF, DATE PART
  - FLOOR, CEILING
  - GETUTCDATE, GETDATE, CURRENT_TIMESTAMP, SYSDATETIME
  - DATE NAME, ISDATE
  - WEEKDAY, MONTHNAME, WEEKDAYNAME
  - SECOND, MINUTE, HOUR, ISDATE
- Other Generic Functions
  - COALESCE, NULL IF, CURRENT USER, IIF
  - ISNULL, NULLIF, SESSION_USER
  - SESSIONPROPERT, SYSTEM_USER, USER_NAME
  - FORMAT, INSTR, CONCAT
- Cast and Convert Functions
- IF, ELSE, CASE, WHEN & END
- PIVOT & UNPIVOT
- ANALYTICAL FUNCTIONS
  - ROW_NUMBER () and real time examples
  - RANK () and real time examples
  - DENSE RANK () and OVER () usages
  - NTILE advantage
  - PARTITION BY advantage
  - Using Group BY along with Analytical Partition
- User Defined Functions Create
- User Defined Functions Calling
- Differences between Function &Procedure

TOPIC 22: STORED PROCEDURES [USER DEFINED]

- Use in Real Time and Types
- System Defined and User Defined Procedures
- Dynamic SQL Queries in Procedures
- IN, OUT, INOUT Parameters
- Compare Procedures and Functions
- READONLY Parameters
- Dynamic Data Insertions with Procedures
- Table Variables, Cloning & Data Inserts
- Using TEMP tables in procedures
- Stored Procedure inside Stored Procedure
- Optimizing tips for procedure

TOPIC 23: DIFFERENT TYPES OF TABLES, VARIABLES, AND CTE

- Local variables vs Global variables with examples
- Local variables Vs. Temp variables and real time usage
- TEMPORARY table usages in real time
- Inline View Vs. Normal View
- CTE: Common Table Expressions
- CTE usage in real time
- Multiple examples using CTE
- ROW_NUMBER () with CTE Queries
- Recursive CTE

TOPIC 24: TRIGGERS

- Use in Real Time and Types
- SCHEMA BINDING
- Triggers Vs. Procedures
- Types of triggers
  DML TRIGGERS, DDL TRIGGERS,FOR TRIGGERS, INSTEAD OF TRIGGERS
  Rel-time usage of triggers at events

TOPIC 25: CURSORS [USER DEFINED]

- What is cursor and advantages of it.
- Cursor Vs. Stored Procedure
- Working on different types of cursors
- Types of triggers
  Static Cursors, Dynamic Cursors, Global Cursors, Local Cursors,
  Forward only Cursors, Scroll Cursors, Keyset Cursors

TOPIC 26: TRANSACTIONS, CHECKPOINT, AND DTC

- What is Transaction? usage of it?
- What is DTC [Distributed Transaction Coordinator]
- What is Checkpoint? usage of it?
- Transactions Vs. Checkpoint

TOPIC 27: PROGRAMMING AND ERROR HANDLING INSTRUCTIONS

- IF, IIF, CASE
- Error Handling in T-SQL
- WHILE, WHEN
- Try, Catch, Throw

TOPIC 28: DYNAMIC SQL IMPLEMENTATION

- Creating Dynamic SELECT statement
- Passing dynamic table names
- Create a procedure with dynamic table names and variables
- Normal SQL Vs. Dynamic SQL

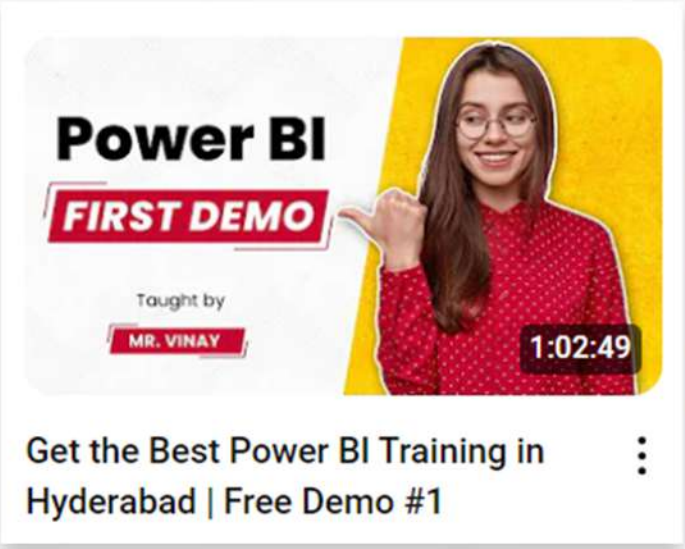
TOPIC 29: FUNCTIONS [User Defined]

- Functions Vs. Procedures
- Functions returning tables
- Functions returning normal variables
- Calling inline functions

TOPIC 30: PERFORMANCE TUNING AND OPTIMIZATION PROCESS

- Examples of performance issues in real time
- DTA (DB Engine Tuning Advisor)
- Audit Long Running Queries using DMVs and DMFs
- Activity Monitor Tool and Query Statistics Reports
- Logical I/O, Physical I/O and Database I/O, Wait Time
- Partition Functions and Partition Schemes - Usage
- Index Management : Internal, External Fragmentation
- Index Page Count and Index Condition Checks
- ONLINE and RESUME Options
- Fast, Detailed Scans and Stats NoRecompute usages
- Creating Workload Files and Trace Files
- DTA with Query Cache (Procedure Cache) & .SQL File Inputs advantage
- Full Text Search (FTS) Mechanism advantage
- Processor, Disk, Memory, Transactions, Database Counters
- Query Costs : IO, CPU Cost, SubTree Cost, Operator Cost
- Parameter Sniffing and OPTIMIZE Options
- Spooling Mechanism and Spool Types for Query LoadS
- Execution Plan Issues with Parameter Sniffing
- Query Blocking Scenarios and Lock Monitors
- Serializable, Snapshot, Repeatable Read Isolation /li>
- Deadlock Simulation and Deadlock Prevention usage
- Full Text (FT) Indexes: Query Tuning. Filter Daemon Host
- Histograms and Event Handling Options
- Working with SQL SERVER Profiler
- Using Perfmon Tool and AM Tool
- Implementing Compressions for Read Only Data
- Parameter Sniffing and OPTIMIZE Options
- Implementing environment areas in the real time [DEV, TEST, UAT, and PROD]
- Real time scenarios and many important tips

A Big Thank you



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